

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Claims 1-14 (canceled).

Claim 15 (currently amended). A manufacturing apparatus of a photo mask blank ~~for carrying out the manufacturing method according to claim 1.~~ having a thin film for forming a pattern on a transparent substrate, the manufacture of said thin film comprising the steps of:

directing the surface of a target downwards and the surface of a substrate upwards with respect to a gravity direction; shielding a peripheral edge of said substrate to prevent the film from being formed on the peripheral edge; and sputtering/forming said thin film.

Claim 16 (currently amended). A manufacturing apparatus of a photo mask blank ~~for carrying out the manufacturing method according to claim 2.~~ having a thin film for forming a pattern on a transparent substrate, the manufacture of said thin film comprising a step of:

manufacturing said thin film using a DC magnetron sputtering apparatus comprising at least a sputtering

target, a magnetron cathode with the target attached thereto, a substrate holder disposed opposite to said target, and a shield disposed on an inner wall of a vacuum tank inside the vacuum tank,

wherein the surface of a target is directed downwards with respect to a gravity direction, and

the apparatus has a mechanism for reducing film formation on a non-sputtered area on the target and the surface of the shield.

Claim 17 (currently amended). A manufacturing apparatus ~~of a photo mask blank for carrying out the manufacturing method according to claim 3.~~ according to claim 16, wherein said mechanism for reducing the film formation onto the non-sputtered area on the target comprises a mechanism in which a whole-surface erosion cathode is used as the magnetron cathode, a mechanism for shielding the non-sputtered area on the target, or a mechanism for roughening the surface of a non-sputtered portion on the target.

Claim 18 (currently amended). A manufacturing apparatus ~~of a photo mask blank for carrying out the manufacturing method according to claim 4.~~ according to claim 17, wherein said mechanism for reducing the film formation onto the

non-sputtered area on the target further comprises a mechanism for forming a corner in the target into a curved surface, and roughening an end surface of the target.

Claim 19 (currently amended). A manufacturing apparatus ~~of a photo mask blank for carrying out the manufacturing method according to claim 5.~~ according to claim 16, wherein the mechanism for reducing the film formation on the shield surface keeps the shield at a constant temperature, and a shape of the shield is designed so that a relative film formation speed t in the following equation (i) in at least a shield position in the vicinity of the target is prevented from being larger than a value in a position on the substrate:

$$t = \cos\theta_1 \times \sin(\theta_1 - \theta_2) / r^2 \quad (i)$$

(in the equation (i), r denotes a distance between a target center and a shield position, θ_1 denotes an angle of a line connecting the target center to the shield position with respect to a normal of a target plane, θ_2 denotes an angle of a shield plane with respect to the normal of the target plane, and t denotes the relative film formation speed in the shield position defined by r and θ_1).

Claim 20 (currently amended). A manufacturing apparatus ~~of a photo mask blank for carrying out the manufacturing method according to claim 6.~~ according to claim 19, wherein the mechanism for reducing the film formation onto said shield surface comprises a mechanism for forming a corner in the shield into a curved surface, roughening the surface of the shield, and disposing an earth shield above the target plane.

Claim 21 (currently amended). A manufacturing apparatus ~~of a photo mask blank for carrying out the manufacturing method according to claim 7.~~ according to claim 16, wherein the apparatus further comprises a backing plate to which the target is to be attached, and the surface of the backing plate is roughened.

Claim 22 (currently amended). A manufacturing apparatus ~~of a photo mask blank for carrying out the manufacturing method according to claim 8.~~ according to claim 16, wherein the apparatus further comprises a shield plate for preventing the film from being formed on a peripheral portion of the substrate.

Claims 23-26 (canceled).

Claim 27 (withdrawn). A pattern transfer method using the photo mask according to claim 23 to transfer a pattern.